

WHAT IS CLAIMED IS:

- 1        1.     A method for making a field emitter device comprising the steps of:  
2                providing a substrate;  
3                treating said substrate to modify a morphology of said substrate; and  
4                growing a carbon film on said treated substrate.
- 1        2.     The method as recited in claim 1, wherein only a portion of said substrate  
2                is subjected to said treating step, and wherein said carbon film grown on said  
3                treated substrate is a better field emitter than carbon film grown on an untreated  
4                portion of said substrate.
- 1        3.     The method as recited in claim 2, wherein said carbon film grown on said  
2                treated portion of said substrate emits substantially more electrons when subjected  
3                to a specified electric field than said carbon film on said untreated substrate.
- 1        4.     The method as recited in claim 1, wherein said substrate is treated with a  
2                base, wherein said treating step changes the chemical composition of said surface  
3                of said substrate.
- 1        5.     The method as recited in claim 1, wherein said substrate is treated with an  
2                acid.

- 1 6. The method as recited in claim 5, wherein said substrate is a ceramic.
- 1 7. The method as recited in claim 5, wherein said substrate is a metal.
- 1 8. The method as recited in claim 5, wherein said substrate is a glass.
- 1 9. The method as recited in claim 1, further comprising the step of performing  
2 sonication on said substrate.
- 1 10. The method as recited in claim 3, wherein said substrate was not subjected  
2 to a sonication step.
- 1 11. The method as recited in claim 1, further comprising the steps of:  
2 depositing a metal layer on said substrate whereby said metal layer has a  
3 predefined pattern so that a portion of said substrate is accessible through said  
4 metal layer, wherein said depositing step is performed before said growing step.
- 1 12. The method as recited in claim 11, wherein said step of growing said  
2 carbon film also deposits said carbon film on said metal layer, wherein said carbon  
3 film is a continuous film.

1        13.    The method as recited in claim 11, wherein said step of depositing said  
2        metal layer on said substrate further comprises the steps of:  
3                depositing said metal layer on said substrate;  
4                patterning said metal layer using photolithography; and  
5                etching said metal layer producing said predefined pattern.

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1 14. A field emitter device manufactured by the following steps:  
2 providing a substrate;  
3 treating said substrate to modify a morphology of said substrate; and  
4 growing a carbon film on said treated substrate, wherein only a portion of  
5 said substrate is subjected to said treating step, and wherein said carbon film  
6 grown on said treated substrate is a better field emitter than carbon film grown on  
7 an untreated portion of said substrate, wherein said carbon film grown on said  
8 treated portion of said substrate emits substantially more electrons when subjected  
9 to a specified electric field than said carbon film on said untreated substrate.

1 15. The device as recited in claim 14, wherein said substrate is treated with an  
2 acid.

1 16. The device as recited in claim 15, wherein said substrate is a ceramic.

1 17. A method for depositing a carbon film comprising the steps of:  
2 depositing a metal layer on a substrate whereby said metal layer has a  
3 predefined pattern so that a portion of said substrate is accessible through said  
4 metal layer; and  
5 depositing said carbon film on said portion of said substrate.

1 18. The method as recited in claim 17, wherein said step of depositing said  
2 carbon film also deposits said carbon film on said metal layer.

1 19. The method as recited in claim 18, wherein said carbon film is a continuous  
2 film.

1 20. The method as recited in claim 17, wherein said step of depositing said  
2 metal layer on said substrate further comprises the steps of:  
3 depositing said metal layer on said substrate;  
4 patterning said metal layer using photolithography; and  
5 etching said metal layer producing said predefined pattern.

1 21. The method as recited in claim 20, wherein said etching step roughens a  
2 surface of said substrate at said portion of said substrate.

1 22. The method as recited in claim 21, wherein said substrate is a ceramic-like  
2 material.

1 23. The method as recited in claim 17, wherein said step of depositing said  
2 metal layer on said substrate further comprises the steps of:  
3 etching said substrate, wherein said etching step changes the chemical  
4 composition of said surface of said portion of said substrate; and  
5 depositing said metal layer on said substrate through a mask producing said  
6 predefined pattern.

1 24. The method as recited in claim 23, wherein said etching step roughens a  
2 surface of said substrate.

1 25. The method as recited in claim 20, wherein said etching step changes the  
2 chemical composition of said surface of said portion of said substrate.

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